

#### IV. NEW SPECIES FROM THE OLIGOCENE OF THE UINTA.

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It is quite clear that the name "Upper Uinta," which was used by Peterson and Kay in their publication, *Ann. C. M.*, Vol. XX, pp. 293-305, might in the future be a source of confusion to students. The "Upper Uinta" is a term which was and will be commonly used by geologists and paleontologists in referring to the upper series of the Uinta Eocene, especially "Horizon C." The name "Duchesne," suggested by Scott,<sup>1</sup> is therefore proposed for the Oligocene horizon, which rests upon the Upper Eocene (Horizon C) in the Uinta Basin. The Duchesne River in Duchesne County, Utah, has its source on the southern side of the Uinta Mountains. The stream traverses these upper beds, which are now determined to be Basal Oligocene, before its confluence with the Green River a half mile below Ouray, Utah. As stated by Peterson and Kay, *l.c.* p. 294, the geographical area covered by these Oligocene strata has an east-west extent of approximately eighty miles, and seldom exceeds from twelve to fifteen miles in a north-south direction along the northern margin of the Uinta Basin. From Randlette westward, along the Duchesne river, these Oligocene beds are quite clearly defined from the underlying Uinta series (Horizon C). Peterson and Kay (*l.c.*, p. 295) have already called attention to the fact that "the sandstones weather out to characteristic reddish brown cliffs, which rest on softer clays [Horizon C of the Uinta] along the streams and on the divides between Lake Fork, 'Dry Gulch,' Duchesne, and the course of other rivers." Although a tentative division was made by Peterson & Kay between the Duchesne beds and the underlying Uinta strata to the eastward from Randlette, the distinction between the two horizons is not so clear toward the eastern end of the basin.

The relationship of the fauna of the Duchesne Oligocene, as now known, is less sharply defined from that in the underlying Uinta

<sup>1</sup>Since the publication of *Annals of the Carnegie Museum*, Vol. XX, 1931, Art. XII, pp. 293-305, Professor W. B. Scott of Princeton University has in a letter kindly suggested the name "Duchesne" for the Oligocene formation named "Upper Uinta," by Peterson and Kay.

sediments (Horizon C) than is usually the case in the superimposed horizons of other localities. There is, nevertheless, an advance corresponding to that of the lithological change noted.<sup>2</sup> The Titanotheres of the Duchesne Oligocene so far known represent an advance upon those found in Horizon C of the Uinta series. *Teleodus uintensis*<sup>3</sup> is a typical Oligocene form, with frontonasal horns well developed; with two upper and three lower incisors, bearing the characteristic button-shaped crowns found in all the known Titanotheres of the White River Oligocene. The horses, or Anchitheres, and Tapiroids have the lower premolars more like the molars. The Cameloids are very distinctly advanced in the direction of those found in the White River Oligocene. The genus *Hyænodon* of the eastern Oligocene, not heretofore found in the Eocene of America, is recognized. With this assembly of forms there are, so far found, remains of Anchitheres, Amynodonts, Homacodonts, Agriochærids, and Mesonychids, as survivors from the underlying Eocene. The Amynodonts have the second lower premolar reduced to vestigial proportions. The Homacodonts and Mesonychids<sup>4</sup> have advanced in their trend of evolution. It is quite safe to say, that, when more complete material is found representing the Agriochærids and the Oreodonts, they will be found to have similarly advanced.

The Duchesne Oligocene of the Uinta Basin may thus be regarded as a horizon quite perfectly transitional between the Upper Eocene and the Chadron horizon<sup>5</sup> of the White River series of South Dakota. We were gratified in finding in the Duchesne Oligocene the genus *Hyænodon*, hitherto not reported from so low a level in the American Oligocene. In this vast deposit of strata, over one thousand feet thick, we have not yet discovered any horizons which abruptly traverse the formation, such as the well known *Metamynodon* and *Protoceras* Sandstones; the two latter being stream deposits, which contain sudden breaks in the Oligocene fauna of the White River Badlands of

<sup>2</sup>See Annals Carnegie Museum, Vol. XX, 1931, pp. 294-298.

<sup>3</sup>Annals Carnegie Museum, Vol. XX, 1931, p. 308.

<sup>4</sup>Annals Carnegie Museum, Vol. XX, 1931, p. 338.

<sup>5</sup>It should be noted here that the fauna which Mr. Douglass described from the "Sage Creek Beds" of Montana, Ann. Car. Mus. Vol. II, 1903, pp. 155-160, is in part probably a later facies than that in the Duchesne Oligocene of Utah. The stratum of the Sage Creek Beds of Montana in which "*Metamynodon*" was found might therefore have to be placed between the Chadron of Nebraska-Dakota and the Duchesne series of Utah.

South Dakota. The evidence of stream-action is abundant in the Duchesne series, but the scarcity of fossil remains through the entire formation precludes at this time any clear comparison with what is known of the Oligocene of Dakota.

Of the fossils described in the following pages the fragment of an upper jaw as well as limb bones of *Hyænodon* were found in 1929 in the Titanotheres quarry of the upper Duchesne Oligocene and the fragment of a lower jaw of the Amynodont described in the following pages was found in the same quarry in 1930. The rest of the material described in what follows was collected in different horizons of the Oligocene of the Uinta Basin by the field-party of the Carnegie Museum in charge of Mr. J. LeRoy Kay in 1931. The illustrations are from drawings made by Mr. Sydney Prentice.

**Class REPTILIA.**

**Order CROCODILIA.**

**Family ALLIGATORIDÆ.**

**Genus CROCODILUS.**

**1. *Crocodylus* (?) *acer* Cope.**

A very poorly preserved skull and lower jaws, C. M., No. 11858, discovered near the base of the Duchesne Oligocene in the Uinta Basin, Utah, is provisionally referred to the genus *Crocodylus*. The specimen was found three miles north of the Leota Ranch in Uinta County. By the liberal use of shellac and extreme care in collecting it was possible to transport this frail specimen from the field to the Museum. For detailed and reliable description this specimen requires an amount of most painstaking and careful work in the laboratory, which cannot be done in advance of the publication of the present paper. From the superficial study, which I have been able to give in the present condition of the specimen, it appears most nearly like *Crocodylus* (?) *acer* Cope<sup>6</sup> from the "Manti formation" in central Utah, re-described by Charles C. Mook.<sup>7</sup> The long and comparatively narrow form of the head; the irregularly rounded and anteriorly pointed orbits; the flat surface of the snout (undoubtedly due, in a great measure, to crushing); the broad surface between the superatemporal fenestræ and the apparently large infratemporal fenestræ are the

<sup>6</sup>"Tertiary Vertebrata" 1884, p. 154, Pl. XXIII, fig. 1.

<sup>7</sup>Bull. Amer. Mus. Nat. Hist., Vol. XLIV, 1921, p. 117, Pls. XVIII, XIX.

chief characters, on which I rely for the present identification. The upper and lower jaws are so closely appressed that no idea can be had of the characters or position of the teeth in the present condition of the specimen. The lower jaws are quite slender, there being apparently no such expanse between the alveolar and inferior borders of the rami as in *Allognathosuchus*, or as in *Crocodilus americanus*.

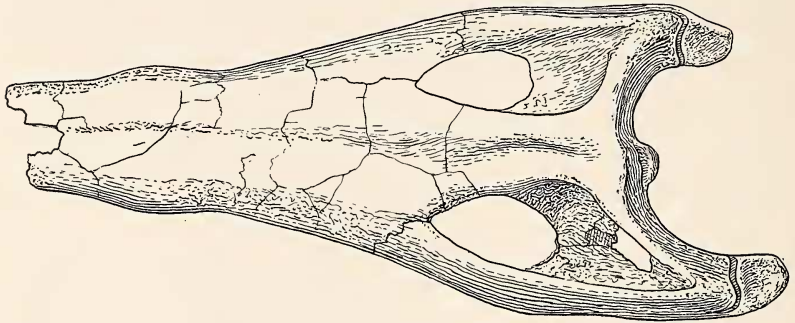


FIG. 1. Top view of skull. *Crocodilus (?) acer* Cope. C. M., No. 11858, One-fourth natural size.

MEASUREMENTS OF SKULL.

Greatest length, approximately.....	400 mm.
Length from occipital condyle to end of snout, approximately.....	350 mm.
Width opposite orbits.....	155 mm.
Width of snout midway to anterior extremity.....	86 mm.
Width at narrowest part, behind anterior nares.....	68 mm.

Class MAMMALIA.

Order CARNIVORA.

Family HYÆNIDÆ.

Genus HYÆNODON.

2. *Hyænodon* sp. (?)

A portion of a maxillary of the right side, with the two last molars in place (C. M., No. 11770), and a humerus (C. M., No. 11764), is referred to the well known genus *Hyænodon* of the Nebraska and Dakota Oligocene. The specimens were found in the Duchesne Oligocene together with the great mass of material representing *Teleodus uintensis* in the Titanothera Quarry eleven miles west of Vernal. The maxillary represents an animal smaller than *Hyænodon*

*cruentus*, but larger than *Hyænodon crucians*. With the exception of a well-marked swelling on the external face of the sheering blade, midway between the anterior cusp and the posterior limit of the last tooth, the detailed structure of these teeth most closely suggests those of *Hyænodon cruentus*. On the last tooth there is no indication of an antero-internal basal tubercle, while on the tooth in front there is a very slight indication of such a tubercle. The maxilla is broken off at the posterior alveolus of the larger tooth and in front of the first molar.

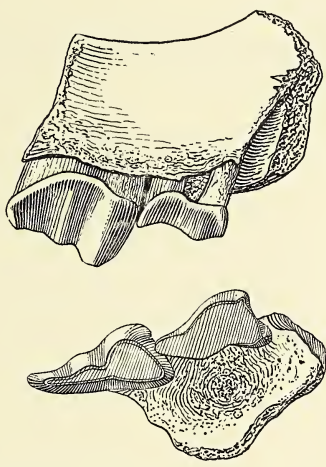


FIG. 2. External and crown views of M<sup>1</sup>, M<sup>2</sup>. *Hyænodon* sp.?  
C. M., No. 11770. Natural size.

MEASUREMENTS.

M <sup>1</sup> length, measurement taken at base of crown.....	13 mm.
M <sup>1</sup> width, at anterior face.....	7 mm.
M <sup>2</sup> length, measurement taken at base of crown.....	20 mm.
M <sup>2</sup> width, at anterior face.....	7 mm.

The right humerus, C. M., No. 11764, represents that of a smaller animal, about the size of *Hyænodon mustelinus*, though slenderer and relatively less expanded at the head and distal end. As in *Hyænodon* the articulation for the scapula faces almost as much backward as proximally. The tuberosities are wide apart, displaying a wide and shallow bicapital groove. The deltoid crest is not prominent. The supinator ridge is low and poorly developed and the external epi-

condyle is likewise poorly developed, while the inner condyle is large and perforated by the characteristic foramen. The supratrochlear and anconeal fossæ communicate by a large foramen characteristic of the genus. The distal trochlea is distinctly typical of *Hyænodon* and quite perfectly answers the description given by Professor Scott,<sup>8</sup> who states that the trochlea "is divided into three facets, of which the inner one is both the widest and the highest, while the outer one is very narrow; the median facet is a broad and strongly convex [ridge]."

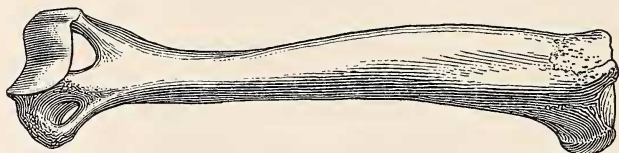


FIG. 3. Anterior view of right humerus, *Hyænodon* sp.?  
C. M., No. 11764. Natural size.

#### Family MIACIDÆ.

#### 3. *Pleurocyon* sp. ? an *Uintacyon* sp. ?.

Included in the small collection found near the base of the Duchesne Oligocene, three miles north of Leota Ranch, are a number of fragments, C. M., No. 11850, which are provisionally referred to such genera as *Pleurocyon* described by Peterson<sup>9</sup> or to *Uintacyon*. The specimens consist of the head of a humerus, a portion of an ulna, fragments of shafts of limb-bones and a number of foot-bones. The first metatarsal of this specimen perhaps compares best with that of *Pleurocyon*, while the phalanges are apparently more depressed and certainly broader than those in *Pleurocyon*, but otherwise quite similar in structure.

#### SUBORDER PERISSODACTYLA.

#### Family EQUIDÆ.

#### SUBFAMILY HYRACOTHERIINÆ.

#### 4. *Epihippus intermedius* sp. nov.

*Type*: Symphysis and right ramus of lower jaws with incisors, canine, and P<sub>2</sub> and M<sub>3</sub> of adult. C. M., No. 11845.

*Horizon*: Duchesne Oligocene.

<sup>8</sup>Journal Acad. Nat. Sci. Philad. Vol. IX, 1894, p. 513.

<sup>9</sup>Annals of the Carnegie Museum, Vol. XII, 1919, p. 52.

*Locality:* Uinta Basin, Half-way Hollow, five miles north of United States Highway 40, and one mile south of Vernal-La Point road, Uinta County, Utah.

*Specific Characters:* Antero-internal cusp on  $P_3$  single; antero-internal cusp on  $P_4$ , on tooth not worn, very faintly twinned; on very slight wear twinning disappears. On  $M_1$  and  $M_2$  twinning of antero-internal tubercle practically the same as on  $P_4$ ;  $P_1$  single-rooted. No diastema between  $P_1$  and  $P_2$ . Animal slightly larger than *Epihippus gracilis*.

In comparing  $P_2$  of the present specimen with fig. 5b, on Pl. XVIII, in Granger's paper on the "Revision of American Eocene Horses" (Bull. Amer. Mus. Nat. Hist. Vol. XXIV, 1908) it appears that the paraconid of *Epihippus gracilis* (= *uintensis*) is less developed and does not turn inward as in *E. intermedius*. Furthermore, when the lower premolars of the type of the new species are compared with those in a specimen, C. M., No. 3397, referred to *Epihippus parvus*, it becomes quite apparent that the anterior cross-crests in the latter species are higher than the posterior cross-crests, while in *E. intermedius* the anterior cross-crests are no higher than the posterior, exactly the condition found in *Mesohippus bairdii*.  $P_2$  in the latter species differs from that in *Epihippus intermedius* by having the anterior part of the paraconid turned more inwardly and the posterior part (the cross-crest portion of the paraconid) better developed. The transverse diameter of the premolars in *Mesohippus bairdii* is also relatively greater than in *Epihippus intermedius*. These differences together

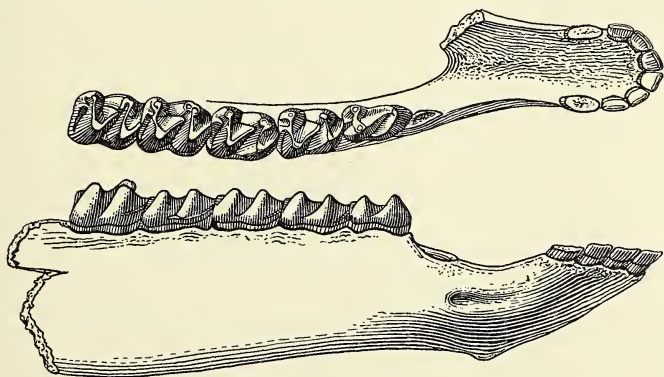


FIG. 4. Crown and side views of right jaw. *Epihippus* (*Duchesnehippus*) *intermedius* Peterson. C. M., No. 11845. Natural size.

with relatively smaller incisors, a larger canine, a longer diastema between  $P_1$  and the canine in *E. intermedius* appear to be the chief differences between *Epihippus intermedius* and *Mesohippus bairdii*.

When the upper dentition of *E. intermedius* is found in the Duchesne Oligocene, it is quite safe to predict, that the antero-internal tubercle on  $P^2$  will be much further advanced in its development of molariform structure than it is in *Epihippus parvus*, and that, the fifth digit of the manus in *E. intermedius* will be found to be considerably more reduced than it is in the species from the lower levels in the Uinta Basin. That *Epihippus intermedius* may represent a distinct genus is entirely probable. When more satisfactorily determined this new genus may be called *Duchesnehippus*.

#### MEASUREMENTS.

Total length of jaw fragment, including incisors.....	84	mm.
Length of diastema between canine and $P_1$ .....	13	mm.
Length of cheek-teeth $P_1$ , $M_2$ .....	49	mm.
Length of $P_2$ .....	9	mm.
Breadth of $P_2$ at posterior cross-crest.....	4.5	mm.
Length of $P_3$ .....	8.5	mm.
Breadth of $P_3$ at posterior cross-crest.....	6	mm.
Length of $P_4$ .....	9	mm.
Breadth of $P_4$ at posterior cross-crest.....	6	mm.
Length of $M_1$ .....	9	mm.
Breadth of $M_1$ at posterior cross-crest.....	6	mm.
Length of $M_2$ .....	9	mm.
Breadth of $M_2$ at posterior cross-crest.....	6	mm.
Depth of ramus of $P_2$ .....	15.5	mm.
Depth of ramus at $M_2$ .....	19	mm.

#### SUPERFAMILY TAPIROIDEA.

#### Family HELALETIDÆ.

#### 5. *Heteraletes*\* *leotanus*, gen. et sp. nov.

*Type*: Pair of lower jaws in adolescent stage. C. M., No. 11849.

*Horizon*: Duchesne Oligocene, near base of series.

*Locality*: Uinta Basin. Three miles north of Leota Ranch and one mile west of Green River, Uinta Co., Utah.

*Generic Characters*:  $I_3$ ,  $C_1$ ,  $P_4^?$ ,  $M_3$ .

$P_2$  with low tricuspid crown,  $P_3$ , sub-molariform;  $P_4$  completely

\*ἕτερος + ὀλήτης



molariform;  $M_1$  and  $M_2$  with cross-crests, anterior and posterior cingulæ as in *Dilophodon* or *Heleletes* from the Bridger Eocene.

The incisors are fan-shaped, the first and second of subequal size, while the lateral incisor is reduced to almost half the size of those in front. The lower canine is rather low-crowned, but of considerable antero-posterior diameter at the base of the crown. The latter rises to a trenchant point. There is a considerable diastema between the canine and the cheek-dentition, which may possibly be slightly exaggerated due to the mending of the specimen.  $P_1$  may, or may not, be present.  $P_2$  has a comparatively simple crown, consisting of the para-, proto-, and metaconids, the protoconid the larger of the three. The crown of  $P_3$  is almost completely molariform; besides the typical paraconid the crown of this tooth has the two complete cross-crests, as in the molars, and there is a well-formed cingulum on the posterior face.  $P_4$  has reached the complete molarization with the two cross-crests and well marked cingulum in front and back. The first and second molars are cross-crested with cingulæ in front and back, as in *Heleletes* or *Dilophodon* from the Bridger Eocene.  $M_3$  is rather deeply buried in the jaw. Its detailed structure cannot be correctly described. The mandibular rami are quite heavy, deep, and have a strong symphysis, the posterior border of which is opposite the junction between  $P_3$  and  $P_4$ .

Not knowing the detailed structure of  $M_3$  the proposed genus is, with the exception of the advanced condition of  $P_3$  and  $P_4$ , most nearly like *Dilophodon* of the Bridger Eocene, though smaller than the latter genus.

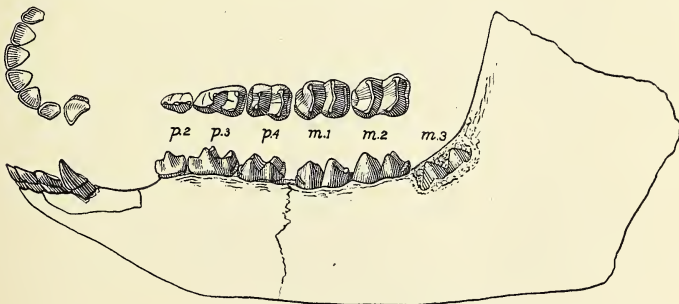


FIG. 5. Crown and side views of lower teeth. *Heteraleles leotanus* Peterson.  
C. M. No., 11849, Natural size.

## MEASUREMENTS.

Length of jaw, incisors to angle of ascending ramus, approximately.....	95 mm.
Length of cheek-dentition P <sub>2</sub> , M <sub>2</sub> .....	33 mm.
P <sub>2</sub> length.....	4.5 mm.
P <sub>2</sub> breadth.....	5.2 mm.
P <sub>3</sub> length.....	6.5 mm.
P <sub>3</sub> breadth.....	4 mm.
M <sub>1</sub> length.....	6.5 mm.
M <sub>1</sub> breadth.....	5 mm.
M <sub>2</sub> length.....	7 mm.
M <sub>2</sub> breadth.....	5 mm.

## Family HYRACODONTIDÆ.

6. Genus *Hyracodon* ? sp. ?

To the genus *Hyracodon* is provisionally referred a femur, C. M., No. 11846, which was found well up in the Duchesne Oligocene of the

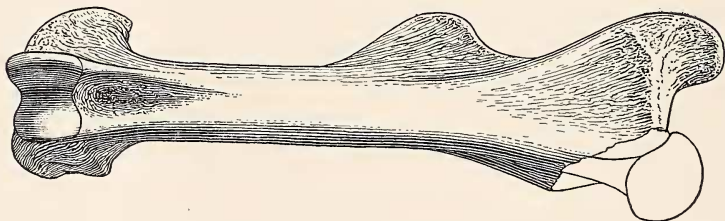


FIG. 6. Anterior view of femur. *Hyracodon*? C. M., No. 11846.  
One-fourth natural size.

Uinta Basin. The bone, though slightly slenderer, compares best with the femur of the larger species of that genus found in the Nebraska

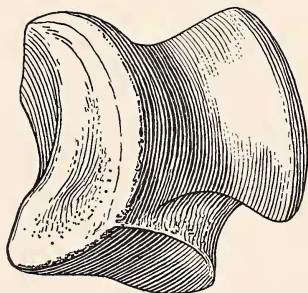


FIG. 7. Dorsal view of astragalus. C. M., No. 11855. Natural size.

Oligocene. The great trochanter, which is relatively slenderer, projects higher above the head than in the eastern form. The latter feature is, however, due mostly to the crushing of the bone. The rotular trochlea is shorter and the condyles are of relatively greater extent vertically than in the eastern species, but this feature may also be due to the distortion of the specimen. An astragalus, No. 11855, found in the same locality and horizon as the femur just described, is also provisionally placed with the genus *Hyracodon*.

Family AMYNODONTIDÆ.

7. *Mesamynodon medius* gen. et sp. nov.

*Type*: Fragment of ramus of the lower jaw of adult animal with portion of root of P<sub>2</sub>, P<sub>3</sub>, and P<sub>4</sub>, together with M<sub>1</sub> and M<sub>2</sub>, C. M., No. 11762.

*Horizon*: Duchesne Oligocene, Upper series.

*Locality*: Uinta Basin. Titanothera Quarry, eleven miles west of Vernal, Uinta County, Utah.

*Generic Characters*: P<sub>2</sub> vestigial; proto- and deutoconid, which form the main cross-crest, relatively low; paraconid and posterior cross-crest high and more completely developed, when compared with

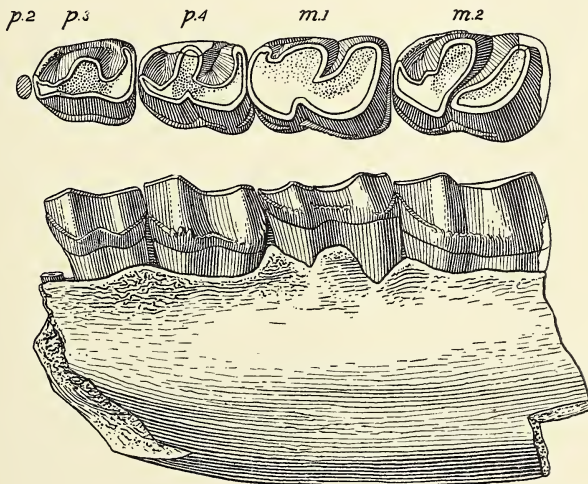


FIG. 8. Crown and side views of left jaw. *Mesamynodon medius* Peterson. C. M., No. 11762. Natural size.

lower premolars of *Amynodon*. Molars as in *Amynodon*, but with cingulum better developed.

In excavating the alveolar border in front of  $P_3$  of the type, a portion of a shallow alveolus with a small fragment of the root of  $P_2$  was found. Judging from this very shallow alveole and the minuteness of the root-fragment this tooth is evidently reduced to a mere vestige in comparison to the already much reduced  $P_2$  of *Amynodon*. In fact the tooth may even be entirely wanting in some individuals, indicating a considerable step beyond *Amynodon* toward such forms as *Metamyndon* of the White River Oligocene. The prominence of the cingulum on both premolars and molars of the present specimen strongly suggests *Hyracodon* of the Nebraska-Dakota Oligocene, but  $P_3$  and  $P_4$  are reduced too much in length, to say nothing of the vestigial  $P_2$ , to place the specimen with the *Hyracodonts*. Provisionally I therefore place *Mesamyndon* in the subfamily *Amynodontinæ* pending the discovery of better diagnostic material.

#### MEASUREMENTS.

Length of jaw fragment.....	66	mm.
Depth of ramus at $M_1$ .....	31	mm.
Length of $P_3$ .....	13	mm.
Breadth of $P_3$ opposite posterior cross-crest.....	95	mm.
Length of $P_4$ .....	15	mm.
Breadth of $P_4$ opposite posterior cross-crest.....	10.5	mm.
Length of $M_1$ .....	17	mm.
Breadth of $M_1$ opposite posterior cross-crest.....	12	mm.
Length of $M_2$ .....	20	mm.
Breadth of $M_2$ opposite posterior cross-crest.....	12.5	mm.

#### SUBORDER ARTIODACTYLA.

##### Family DICHOBUNIDÆ.

##### SUBFAMILY HOMACODONTINÆ.

#### 8. *Pentacemylus*\* *progressus* gen. et sp. nov.

*Type*: Two upper molars of the left side; inner portion of  $P_4$ ;  $M_1$  and  $M_2$  of right side. C. M., No. 11865.

*Horizon*: Duchesne Oligocene, near base.

\*πέντα = five; ἄκρη = point; μῦλος = molar tooth.

*Locality:* Uinta Basin, Utah. Three miles north of Leota Ranch, one mile west of Green River.

*Characters obtained from the type material.* Upper molars five-pointed with protoconule well developed; no evidence of the vestigial hypocone on  $M^2$  which is present in *Bunomeryx*.

Cusps of molars distinctly more crescentic than in *Homacodon* Marsh, from the Bridger Eocene, *Bunomeryx* Wortman, and other genera from the Uinta (Horizon C) described later by Peterson.<sup>10</sup> Upper molars of more nearly equal size than those in earlier genera.  $P_4$  with well developed deuterocoid and paraconid. Lower molars with slightly more advanced selenodont and hypsodont condition than in genera from the Bridger and the Uinta.

With the advanced condition of the cheek-dentition from that of the *Homacodonts* found in the lower strata there still persists the antero-medial tubercle, well developed and entirely separated from the protocone as in *Bunomeryx*. Furthermore, the para- and mesostyles and the cingulum are even better developed than in *Bunomeryx*. The well developed meso- and parastyles in *Pentacemylus* closely suggest *Protoreodon*, but the latter does not have the heavy cingulum bounding the tooth anteriorly, internally, and posteriorly, as is the case in *Pentacemylus*.

The advanced condition in the lower dentition of *Pentacemylus* consists chiefly in the greater development of the para- and deuterocoids and of the greater height of the tubercles along the buccal side of the molars, when compared with *Hylomeryx*, but is more nearly like those in *Bunomeryx* of the lower horizons.

The new genus here proposed evidently stands very close to *Bunomeryx* of the lower horizons of the Uinta, while *Hylomeryx*, *Sphenomeryx*, and *Mesomeryx* stand perhaps closer to *Homacodon*.

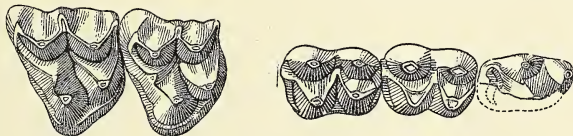


FIG. 9. Crown views of upper and lower teeth. *Pentacemylus progressus* Peterson. C. M., No. 11865. Twice natural size.

<sup>10</sup>Annals Carnegie Museum, Vol. XII, 1919, pp. 67-76.

## MEASUREMENTS.

M <sup>1</sup> anteroposterior diameter.....	6.5 mm.
M <sup>1</sup> transverse diameter.....	7.5 mm.
M <sup>2</sup> anteroposterior diameter approximately.....	6.5 mm.
M <sup>2</sup> transverse diameter.....	7.5 mm.
P <sub>4</sub> , M <sub>2</sub> anteroposterior diameter.....	19 mm.
M <sub>1</sub> anteroposterior diameter.....	6.5 mm.
M <sub>2</sub> anteroposterior diameter.....	6.5 mm.
M <sub>1</sub> transverse diameter.....	4 mm.
M <sub>2</sub> transverse diameter.....	4 mm.

## Family AGRIOCHERIDÆ.

9. Genus *Diplobunops* (?) sp. ?

An upper molar tooth, C. M., No. 11853, about the size of that of *Diplobunops leotensis* found well up in the Duchesne Oligocene series in Half-way Hollow, Uinta County, Utah, is provisionally placed in the genus *Diplobunops*. My principal reason for doing this is the presence of the vestigial protoconule on the crown of the tooth, the poorly developed posterior horns of proto- and hypocones, and the heavy and obliquely backward directed parastyle, as in the Eocene Oreodonts in general.



FIG. 10. Crown view of upper molar. ? *Diplobunops*. C. M., No. 11853. Natural size.

That the tooth may pertain to a distinct new genus is entirely probable, but I prefer to wait until a more complete specimen is found before adding another genus from this new horizon.

Near the base of the Duchesne Oligocene, three miles north of Leota Ranch, Uinta County, Utah, there was found a second specimen consisting of a fragmentary skeleton, C. M., No. 11848, which is provisionally referred to the genus *Diplobunops*. The fragments of the upper teeth indicate an animal the size of *Diplobunops uintensis*. The humerus, femur, and tibia appear to be proportionally lighter and the cnemial crest of the tibia not extending so low as in *Diplobunops*. The astragalus on the other hand, is low and broad, as in the latter genus. The distal articulation of Mt. IV is not hemispherical on the dorsal face, as it is in *Diplobunops*, but more nearly like that in *Merycododon*. The two terminal phalanges present are not high, narrow, and claw-like, as in *Diplobunops*, nor as much depressed, though fully as broad as in *Merycododon*. The lateral borders of the anterior half of the ungual is expanded near the plantar face, giving the bone a

unique appearance. If this specimen pertains to one individual, the combination of the characters noted would certainly indicate a distinct species of the genus *Diplobunops*, if not a distinct genus, nearly allied to the latter. The material is, however, in my judgment unsatisfactory to serve as a type.

Well towards the base of the Duchesne Oligocene series, three miles north of Leota Ranch and one mile west of Green River, Uinta County, Utah, there were found a few fragments of an Oreadont, No. 11864, very nearly the size of *Merycoidodon culbertsoni*. I provisionally place this specimen with *Protoreodon*. The astragalus of the specimen from Utah is wider than in *Protoreodon medius*, but not as broad as in *Merycoidodon*.

Likewise the cuboid is relatively lower than in the latter genus. Altogether the new material, which is too incomplete to be made a type, apparently represents an intermediate form between *Protoreodon* and *Merycoidodon*.

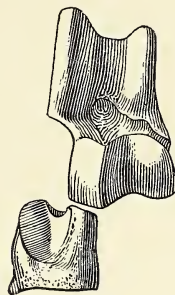


FIG. 11. Dorsal views of astragalus and cuboid. *Protoreodon*. ? C. M., No. 11864. Natural size.

#### Family CAMELIDÆ.

#### 10. *Poabromylus*\*\* *kayi* gen. et sp. nov.

*Type*: Left ramus of the lower jaw with the molar series, including P<sub>3</sub> and P<sub>4</sub>. C. M., No. 11753.

*Horizon*: Duchesne Oligocene, upper series.

*Locality*: Uinta Basin. Titanothera Quarry, eleven miles west of Vernal, Uinta Co., Utah.

*Generic Characters*: Jaw slender<sup>11</sup>; P<sub>2</sub>, P<sub>3</sub>, and P<sub>4</sub>, of semiequal length, as in *Poëbrotherium wilsoni*. P<sub>3</sub> and P<sub>4</sub> relatively shorter and thicker; protoconid rounder and higher, and the basal accessories less distinct than in *Poëbrotherium*. There is a diastema in front of P<sub>2</sub> as in *Poëbrotherium wilsoni*. The molars are relatively shorter and less hypsodont than in *Poëbrotherium*. Animal nearly the size of *Poëbrotherium wilsoni*.

\*\**πῶα* = grass; *βρώω* = I eat; *μύλος* = molar tooth.

<sup>11</sup>The greater part of the inferior border of the ramus is missing, but enough is preserved to determine that the animal had a slender jaw, as in *Poëbrotherium*.

The diastema in front of  $P_2$  is of considerable length (8 mm. from  $P_2$  to where the jaw is broken). As already stated  $P_2$  is close to  $P_3$ , the tooth was implanted by two roots, the alveoli of which are directly anteroposterior, indicating an anteroposterior diameter approximately equal to either of the posterior premolars. The protoconid of  $P_3$  is rather high and terminates in a round pointed apex. The internal face of the main cusp (protoconid) has near its posterior base a cusp-like rib closely adhering to the main body of the protoconid. Together with the external body of the heel this rib on  $P_3$  helps to form a fossa which is open behind. Forward and inward from the protoconid there extends a sharp blade-like tubercle, which likewise helps to form a vertical shallow groove on the inner face of that portion of  $P_3$ , not unlike that in *Poebrotherium*.  $P_4$  is very similar to  $P_3$ , except that the posterior heel in  $P_4$  is more pronounced, the plate-like tubercle on the inner face of the protoconid is slightly better indicated, and the anterior blade-like tubercle heavier. Altogether the premolars in *Poabromylus* are less trenchant than in *Poebrotherium*.

The molars are narrow when compared with the known selenodonts of the Upper Eocene, with the possible exception of *Leptotragulus*. On the whole the molars, as well as the two premolars just described, are most nearly like those of *Poebrotherium wilsoni* of the White River Oligocene, though less hypsodont. The lingual face of  $M_2$  and part of that of  $M_3$  are destroyed, but enough remain to determine that, though the inner face of the molars have the vertical grooves and ridges more pronounced than in *Poebrotherium*, they are on the whole most nearly comparable to those in that genus. A cingulum between the crescents on the external face of the molars is slightly

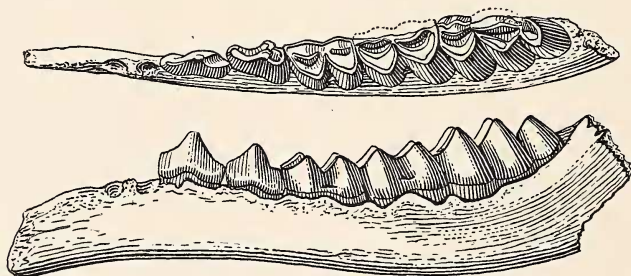


FIG. 12. Crown and side views of dentition and left jaw. *Poabromylus kayi* Peterson. C. M., No. 11753. Natural size.



indicated, especially on the first and second molars. The heel of  $M_3$  is fully as large proportionally as that in *Poebrotherium wilsoni*, but the pillar on the inner face at the junction with the postero-internal crescent in *Poebrotherium* is in the present form represented only by a tubercle, as in *Leptotragulus* of the Uinta.<sup>12</sup>

MEASUREMENTS.

Total length of the jaw fragment. . . . .	80	mm.
Depth of jaw at posterior part of symphysis. . . . .	10	mm.
Depth of jaw opposite $M_3$ , approximately. . . . .	18	mm.
Length of $P_3$ . . . . .	8.5	mm.
Greatest breadth $P_3$ . . . . .	3	mm.
Length of $P_4$ . . . . .	8	mm.
Greatest breadth $P_4$ . . . . .	4	mm.
Length of the molar series. . . . .	35	mm.
Length of $M_1$ . . . . .	9.5	mm.
Greatest breadth of $M_1$ . . . . .	6	mm.
Length of $M_2$ . . . . .	11	mm.
Greatest breadth of $M_2$ approximately. . . . .	7	mm.
Length of $M_3$ . . . . .	21	mm.
Breadth of $M_3$ anterior crescents. . . . .	7	mm.

The proposed genus, just described, differs from "*Leptotragulus*" *profectus* Matthew (Bull. Amer. Mus. Nat. Hist. Vol. XIX, 1903, p. 224) by having the posterior internal crests of the premolars less developed and the anterior crests of the premolars less pronounced. Judging from Matthew's illustration (*l.c.*) of the lower jaw,  $P_2$  in "*Leptotragulus*" *profectus* is very probably a smaller tooth than that in *Poabromylus kayi*. *Camelodon arapahovius* Granger (Bull. Amer. Mus. Nat. Hist. Vol. XXVIII, 1910, p. 248), differs from *Poabromylus kayi* by having a diastema between  $P_2$  and  $P_3$ , heavier heels, and the protoconid more nearly in the mid-body of the premolars, and by a more complicated fifth lobe of  $M_3$ .

The proposed new genus *Poabromylus* is distinctly further advanced than *Eotylopus reedi* from the Lower Oligocene of Wyoming and apparently cannot therefore be regarded as holding an intermediate position between *Protylopus* of the Uinta and *Poebrotherium* of the White River Oligocene. The late Dr. Matthew has pointed out that *Eotylopus* stands closer to *Protylopus* of the Uinta Eocene than to

<sup>12</sup>In the type specimen of *Poabromylus kayi* this pillar is not well indicated due to the broken surface, but a second smaller specimen, No. 11856, has the inner face of the molars well preserved.

*Poëbrotherium* of the Eastern Oligocene.<sup>13</sup> From present evidence *Poabromylus* certainly stands closer to *Poëbrotherium* than to *Protylopus*.

<sup>13</sup>Bull. Amer. Mus. Nat. Hist. Vol. XXVIII, 1910, p. 40.